

CLAIMS

What is claimed is:

1. A heat exchanger apparatus comprising:
a two-dimensional array of heat exchanging conduits;
each conduit having an inlet and an outlet;
a manifold including a plurality of inlet plenums for providing heat exchanging fluid to the inputs of the heat exchanging conduits, and a plurality of outlet plenums for receiving heat exchanging fluid from the outputs of the heat exchanging conduits, and wherein the inlet plenums and outlet plenums are in fluid communication only through said heat exchanging conduits.
2. The apparatus of claim 1 wherein each of the heat exchanging conduits is non-linear.
3. The apparatus of claim 1 wherein each of the heat exchanging conduits is serpentine.
4. The apparatus of claim 1 wherein each of the heat exchanging conduits includes a plurality of interconnected substantially parallel legs.
5. The apparatus of claim 1 wherein the heat exchanging conduits are arranged in linear arrays of heat exchanging conduits.
6. The apparatus of claim 5 wherein adjacent heat exchanging conduits share a common outlet to one of said outlet plenums.

7. The apparatus of claim 5 wherein adjacent heat exchanging conduits share a common inlet to one of said inlet plenums.

8. The apparatus of claim 1 wherein the heat exchanging conduits are arranged in rows and columns.

9. The apparatus of claim 1 wherein each of the heat exchanging conduits comprises a multi-pass finstock element.

10. The apparatus of claim 1 wherein the plurality of the heat exchanging conduits includes linear arrays of multi-pass finstock elements.

11. The apparatus of claim 1 wherein the inlets and the outlets of the heat exchanging conduits are on a same side of the 2-dimensional array.

12. The apparatus of claim 1 wherein the heat exchanging conduits comprise finstock elements of at least about 50 fins per inch.

13. The apparatus of claim 1, wherein the inlet plenums and outlet plenums are generally parallel and alternating channels arranged in an inter-digitated arrangement.

14. The apparatus of claim 13, wherein the manifold includes a plurality of thermal isolation pockets disposed between the inlet plenums and outlet plenums.

15. The apparatus of claim 1, wherein the inlet plenums each have an inlet end in fluid communication with a supply of heat exchanger fluid, and a closed distal end.

16. The apparatus of claim 1, further comprising a faceplate layer, said array of heat exchanging conduits sandwiched between said manifold and said faceplate layer.

17. A heat exchanger, comprising:

a generally planar finstock layer comprising an array of heat exchanging finstock conduits, each conduit having an inlet and an outlet;

a generally planar manifold layer including a plurality of inlet plenums for providing heat exchanging fluid to the inputs of the heat exchanging conduits, and a plurality of outlet plenums for receiving heat exchanging fluid from the outputs of the heat exchanging conduits, and wherein the inlet plenums and outlet plenums are in fluid communication only through said heat exchanging conduits; and

a generally planar faceplate layer having a heat input side, the finstock layer being sandwiched between said manifold layer and said faceplate layer.

18. The heat exchanger of claim 17 wherein each of the heat exchanging conduits has a serpentine flow path configuration.

19. The heat exchanger of claim 18 wherein each of the heat exchanging conduits includes a plurality of interconnected substantially parallel legs.

20. The heat exchanger of claim 17 wherein adjacent heat exchanging conduits share a common outlet to one of said outlet plenums.

21. The heat exchanger of claim 20 wherein adjacent heat exchanging conduits share a common inlet to one of said inlet plenums.

22. The heat exchanger of claim 17 wherein each of the heat exchanging conduits comprises a multi-pass finstock element.

23. The heat exchanger of claim 17 wherein the heat exchanging conduits comprise finstock elements having a fin density of at least about 50 fins per inch.

24. The apparatus of claim 17, wherein the inlet plenums and outlet plenums are generally parallel and alternating channels arranged in an inter-digitated arrangement.

25. The apparatus of claim 24, wherein the manifold includes a plurality of thermal isolation pockets disposed between the inlet plenums and outlet plenums.

26. The apparatus of claim 17, wherein the inlet plenums each have an inlet end in fluid communication with a supply of heat exchanger fluid, and a closed distal end.